

REMARKS

In the Office Action<sup>1</sup>, the Examiner objected to claims 1-4, 7, and 8 under 37 CFR § 1.75(a); rejected claims 1 and 8 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application No. 2001/0041018 A1 to Sonoda ("*Sonoda*"); rejected claim 2 under 35 U.S.C. § 103(a) as being unpatentable over *Sonoda*; rejected claims 3, 4, and 5 under 35 U.S.C. § 103(a) as being unpatentable over the combination of *Sonoda* and Gonzalez, Rafael C. and Woods, Richard E., *Digital Image Processing* (2nd edition) ("*Gonzalez*"); and rejected claim 7 under 35 U.S.C. § 103(a) as being unpatentable over the combination of *Sonoda* and *Gonzalez* in view of U.S. Patent No. 5,517,333 A to Tamura et al. ("*Tamura*"). Applicant has amended the specification and claims 1-5 and 7-8. The Office Action Summary incorrectly lists claims 1-6 and 8 as pending. Claims 1-5 and 7-8 remain pending.

Regarding the objection to claims 1-4, 7, and 8 under 37 CFR § 1.75(a), Applicant has amended the claims to remove the "characterized by" language, in accordance with the Examiner's suggestion. Applicant respectfully requests this objection be withdrawn.

Applicant respectfully traverses the rejection of claims 1 and 8 under 35 U.S.C. § 102(b) as being anticipated by *Sonoda*. Claim 1 as amended recites:

1. An image processing apparatus comprising:

reduced image generation means for generating a reduced image based on a logarithmic luminance  $\log L(p)$  of a frame;

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<sup>1</sup> The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Office Action.

correction information acquisition means for acquiring correction information of the frame based on the reduced image; and

grayscale conversion means for converting grayscale of the frame;

wherein the grayscale conversion means corrects contrast of the frame using the correction information, as a processing to be performed before and/or after the grayscale is converted.

*Sonoda* does not disclose at least the reduced image generation means or the correction information acquisition means.

*Sonoda* discloses, "The prescan which reads the image at a low resolution for determining An [sic] image processing condition and the like is first executed in advance of image reading (fine scan) for outputting a print to determine the image processing condition." (§ 40.) *Sonoda* does not disclose "generating a reduced image based on a logarithmic luminance," as recited in claim 1. *Sonoda* thus cannot disclose a "correction information acquisition means for acquiring information of the frame *based on the reduced image*."

Accordingly, *Sonoda* cannot anticipate claim 1. Independent claim 8, though different in scope than claim 1, is allowable over *Sonoda* for at least the same reasons as claim 1. Claims 2-5 and 7 depend from claim 1 and thus are allowable over *Sonoda* for at least the same reasons as claim 1.

Applicant respectfully traverses the rejection of claim 2 under 35 U.S.C. § 103(a) as being unpatentable over *Sonoda*. A *prima facie* case of obviousness has not been established. Claim 2 depends from claim 1 and thus is allowable over *Sonoda* for at least the same reasons as claim 1. *Sonoda* does not disclose a "smoothing means for

generating a smooth image having luminance  $L_c$  of pixels composing the frame smoothed based on interpolation calculation using pixels composing the reduced image,” as recited in claim 2. (Office Action at p. 4.) *Sonoda* also does not disclose generating the reduced image “based on a logarithmic luminance.” Accordingly, it would not have been obvious at the time the invention was made to one of ordinary skill in the art to modify the blemish eliminating system disclosed by *Sonoda* to “generat[e] a reduced image based on logarithmic luminance” and then “generat[e] a smoothed image having luminance  $L_c$  of pixels composing the frame smoothed based on interpolation calculation using pixels composing the reduced image.”

Applicant respectfully traverses the rejection of claims 3-5 under 35 U.S.C. § 103(a) as being unpatentable over the combination of *Sonoda* and *Gonzalez*. A *prima facie* case of obviousness has not been established.

Claims 3-5 depend from claim 1 and thus are allowable over *Sonoda* for at least the same reasons as claim 1. *Gonzalez* fails to cure the deficiencies of *Sonoda*. Neither *Gonzalez* nor *Sonoda* disclose the “reduced image generation means” or the “correction information acquisition means” of claim 1, on which claims 3-5 depend.

*Sonoda* further does not disclose the “smoothing means” recited in claim 3 for at least the same reasons as claim 2. *Sonoda* also does not disclose “gain value setting means for setting a gain value  $g$  used for correcting the contrast; wherein the grayscale conversion means generates a contrast-corrected image based on luminance  $L_c$  of pixels composing the frame, luminance  $L_1$  of pixels composing the smoothed image, and a predetermined gain value  $g$ ; and the gain value setting means can be configured so as to set the gain value  $g$  based on input initial gain value  $g_0$ , reference gain value 1,

and an attenuation value  $\text{attn}(\text{Th}_1, \text{Th}_2, L_c)$  calculated using a first luminance threshold value  $\text{Th}_1$ , a second luminance threshold value  $\text{Th}_2$ , and luminance  $L_c$  of pixels composing the frame.” (Office Action at p. 5.)

*Gonzalez* discloses “contrast-stretching transformation” used “to increase the dynamic range of the gray levels in the image being processed.” (p. 85.) Neither *Gonzalez* nor *Sonoda* discloses the “smoothing means” recited in amended claim 3. Neither *Gonzalez* nor *Sonoda* discloses that “the grayscale conversion means generates a contrast-corrected image *based on* luminance  $L_c$  of pixels composing the frame, *luminance  $L_1$  of pixels composing the smoothed image*, and a predetermined gain value  $g$ ,” as recited in claim 3.

“The combination of *Sodona* and *Gonzalez* . . . does not disclose gain value setting means for setting a gain value  $g$  used for correcting the contrast based on an initial gain value  $g_0$  which expresses an inverse  $1/\gamma$ , of a slope  $\gamma$  of the conversion function,” as recited in claim 4. (Office Action at 7.) *Gonzalez* discloses “*gamma correction*” based on the equation  $s=r^{1/\gamma}$  where  $s$  equals the output gray level and  $r$  equals the input gray level. (p. 81.) *Gonzalez* does not disclose a “conversion means for generating a tone-converted image by converting luminance  $L$  of pixels composing the frame *based on a conversion function*” and a “gain value setting means for setting a gain value  $g$  used for correcting the contrast based on an initial gain value  $g_0$  which expresses an inverse  $1/\gamma$  of a slope  $\gamma$  of the conversion function,” wherein “the gain value setting means sets the gain value  $g$  *based on input initial gain value  $g_0$ , reference gain value 1, and an attenuation value  $\text{attn}(\text{Th}_1, \text{Th}_2, L_c)$  calculated using a*

*first luminance threshold value  $Th_1$ , a second luminance threshold value  $Th_2$ , and luminance  $L_c$  of pixels composing the tone-converted image."*

*Sodona* and *Gonzalez*, even if combined, do not disclose "the reduced image generation means generates a reduced image by converting the frame into a tone-converted image based on a conversion function and reducing a size of the tone-converted image; the correction information acquisition means acquires correction information including a slope of the conversion function; and the grayscale conversion means corrects contrast of the tone-converted image based on the reduced image and the slope of the conversion function," as recited in claim 5.

Accordingly, *Sodona* and *Gonzalez* fail to render the subject matter of claims 3-5 obvious.

Applicant respectfully traverses the rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over *Sonoda* and *Gonzalez* in view of *Tamura*. A *prima facie* case of obviousness has not been established. Claim 7 depends from claims 1 and 5 and thus is allowable over *Sonoda* for at least the same reasons as claim 1 and is allowable over the combination of *Sonoda* and *Gonzalez* for at least the same reasons as claim 5. *Tamura* fails to cure the deficiencies of *Sonoda* and *Gonzalez*.

"The combination of *Sonoda* and *Gonzalez* does not disclose that the hold means holds the reduced image corresponding to a previous frame's image and a slope of the conversion function applied to the previous frame's image, and the grayscale conversion means corrects the contrast of the tone-converted image based on the reduced image of the previous frame and the slope of the conversion function, both stored in the hold means." (Office Action at 8.) *Tamura* discloses "the correction

coefficient ( $\gamma$ ) for the previous frame held in a correction gamma register 17” and “and the adder 36 provides the same correction coefficient as that of the previous frame.” (col. 7, lines 17-18, 45-46.) *Tamura* does not disclose “the hold means holds the reduced image corresponding to a previous frame’s image” or “the grayscale conversion means corrects the contrast of the tone-converted image based on the reduced image of the previous frame.”

Accordingly, *Sodona*, *Gonzalez*, and *Tamura* fail to render the subject matter of claim 7 obvious.

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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